REMARKS

Claims 31-50 are pending in the present application. In the Office Action mailed June 7, 2004, the Examiner rejected claims 31-50 under 35 U.S.C. §103(a) as being unpatentable over Kruger et al. (US Patent Application Publication 2002/0173715 A1).

Claim 31 calls for, in part, "processing the MR data to account for accrued phase resulting from table velocity; transforming the MR data in a z-direction; correcting the MR data for spatial variations in the magnetic field in the direction of motion; removing unnecessary data at the beginning and ending of each acquisition; and sorting, interpolating, and aligning the transformed MR data to match anatomic locations in the first direction." While it is well recognized that a claim as a whole defines it over the prior art, the above limitations set forth particular areas of distinction between the claimed invention and the known art and, in particular, Kruger et al.

Kruger et al. teaches a sampling of k-space that includes shifting of each phase encode location as a function of table velocity. See ¶[0041-0043]. Specifically, Kruger et al. teaches that "the center of each successively acquired NMR echo signal after Fourier transformation along x is also shift along the x-axis due to table movement." *Id.* Kruger et al. further teaches that the amount of this shift from the reference position x(0) is measured at the time of view acquisition using an electronic spatial encoder and is used to properly fill the k-space matrix. Contrary to the assertions of the Examiner, however, this positional correction of Kruger et al. is not equivalent to processing MR data to account for accrued phase resulting from table velocity. Kruger et al. is unconcerned with accrued phase; Kruger et al. is concerned with coordinating table movement and echo sampling. Kruger et al. also teaches a pixel and sub-pixel correction for table displacement using phase manipulation. However, using phase manipulation to correct for table displacement is not tantamount for taking into account accrued phase during processing MR data. In short, Kruger et al. fails to teach or suggest processing MR data to account for accrued phase resulting from table velocity as claimed.

Additionally, Kruger et al. fails to teach or suggest an MR imaging technique that includes correcting MR data for spatial variations in the magnetic field in the direction of motion. As stated above, Kruger et al. teaches a positional correction that is applied to acquired MR data to correct errors associated with displacement of the patient as the

MR data is acquired. Specifically, the reference teaches a technique that accounts for incongruity between the number of pixels with each displacement of the patient in the X direction. *See* ¶[0044]. One skilled in the art will readily appreciate that correcting for displacement errors as a result of moving-table acquisition is not tantamount to correcting for spatial variations in the magnetic field in the direction of motion.

Furthermore, Kruger et al. fails to teach the step of removing unnecessary data at the beginning and ending of each acquisition. Applicant agrees that the reference teaches homodyne and zero-filling of k-space, but neither of these processes is equivalent to removing data. Both homodyne and zero-filling involve the lack of data acquisition to expedite data acquisition. Each fall in the category of partial Fourier transforming whereby portions of k-space are estimated, rather than acquired, from the complex conjugate of acquired MR data. Neither process involves the discarding of data that has otherwise been acquired. Moreover, neither process involves, with any specificity, the treatment of data at the beginning and ending of each acquisition. As such, Kruger et al. fails to teach or suggest that which is claimed.

In addition, Kruger et al. fails to teach or suggest sorting, interpolating, and aligning the transformed MR data to match anatomic locations in the first direction. Kruger et al. aligns acquired MR data relative to a reference table position, but not any anatomic locations. In fact, Kruger et al. teaches that "the location of each acquired view in the data matrix 16 is determined by two factors, the view number and the location of the patient table at the time the view was acquired." *See* ¶[0041]. As noted above, Kruger et al. also teaches several processes that are directed to account for table displacement in the x-direction. However, none of these processes involve the aligning of transformed MR data to anatomic locations in the first direction. As such, Kruger et al. fails to teach or suggest that claimed.

The Examiner also rejected claims 45 and 50 as being unpatentable over Kruger et al. While claims 45 and 50 are directed to different subject matter, there are commonalities between the claims and, as such, for purposes of expediting examination, the Examiner's rejection of these claims will be considered jointly.

Claims 45 and 50 call for, in part, positioning of a patient table at a location superior or inferior to a desired FOV and accelerating the table to a desired constant velocity before a leading edge of the desired FOV reaches a slab fixed in position. In contrast, Kruger et al. teaches that "after the injection of the contrast agent at process

block 240, 2D images are rapidly acquired and reconstructed to display the vasculature at the starting boundary of the FOV_{tot}." Kruger et al. continues, "Arrival of the contrast bolus is detected at process block 242 by observing when the arteries brighten." "At this time table movement is initiated as indicated at process block 244." *See* ¶[0039]. As clearly provided, Kruger et al. does not begin table movement until after the contrast agent is detected at the leading edge or starting boundary of the FOV. Moreover, Kruger et al. teaches that images are rapidly acquired and reconstructed to display the vasculature at the starting boundary of the FOV. It therefore follows that the patient table is placed at the starting boundary of the FOV so that images from the starting boundary are acquired. As such, Kruger et al. fails to teach placement of the table superior or inferior to the FOV. Accordingly, if the table is initially placed at the starting boundary of the FOV and table movement is not initiated until the contrast is detected in the arteries at the starting boundary, then Kruger et al. cannot be held to teach or suggest acceleration of the patient table to a constant velocity before the leading edge of a desired FOV reaches a slab fixed in position, as presently claimed.

Therefore, in light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 31-50.

Applicant appreciates the Examiner's consideration of these Amendments and Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,

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